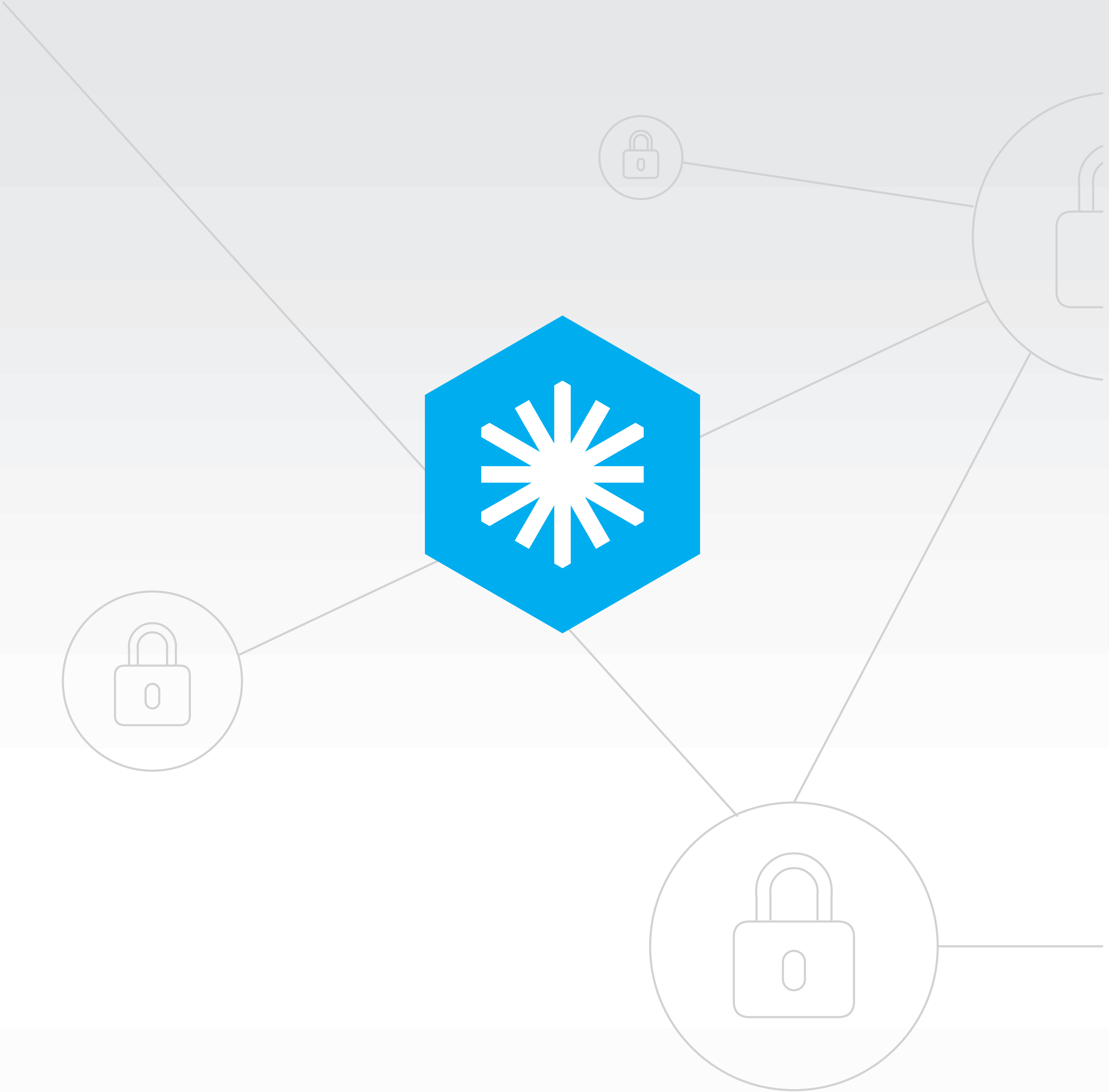


BTS-T

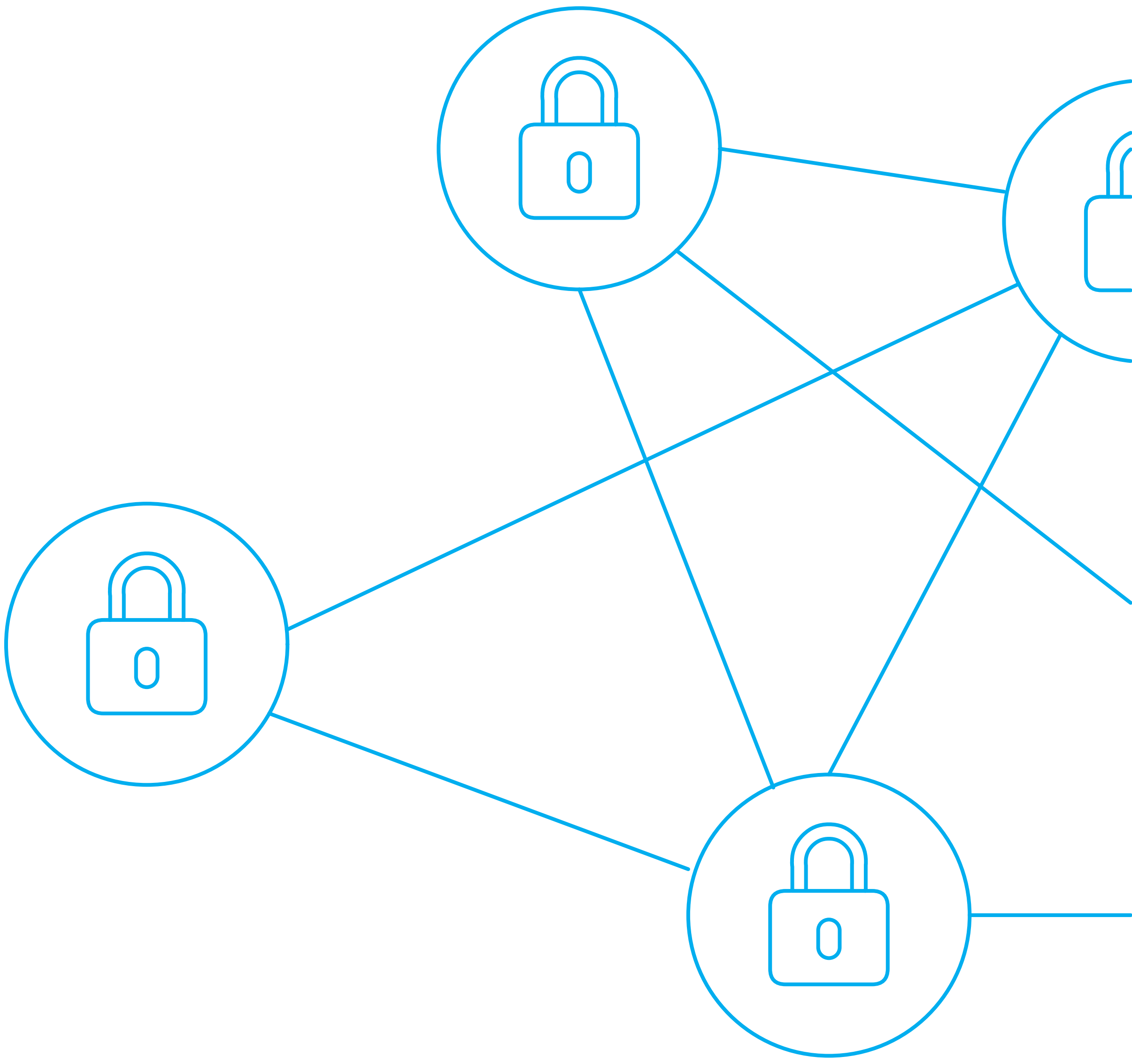
Blockchain Ticketing System

1. WHAT IS BLOCKCHAIN?

A distributed database that maintains a continuously-growing list of transactions grouped in so called blocks

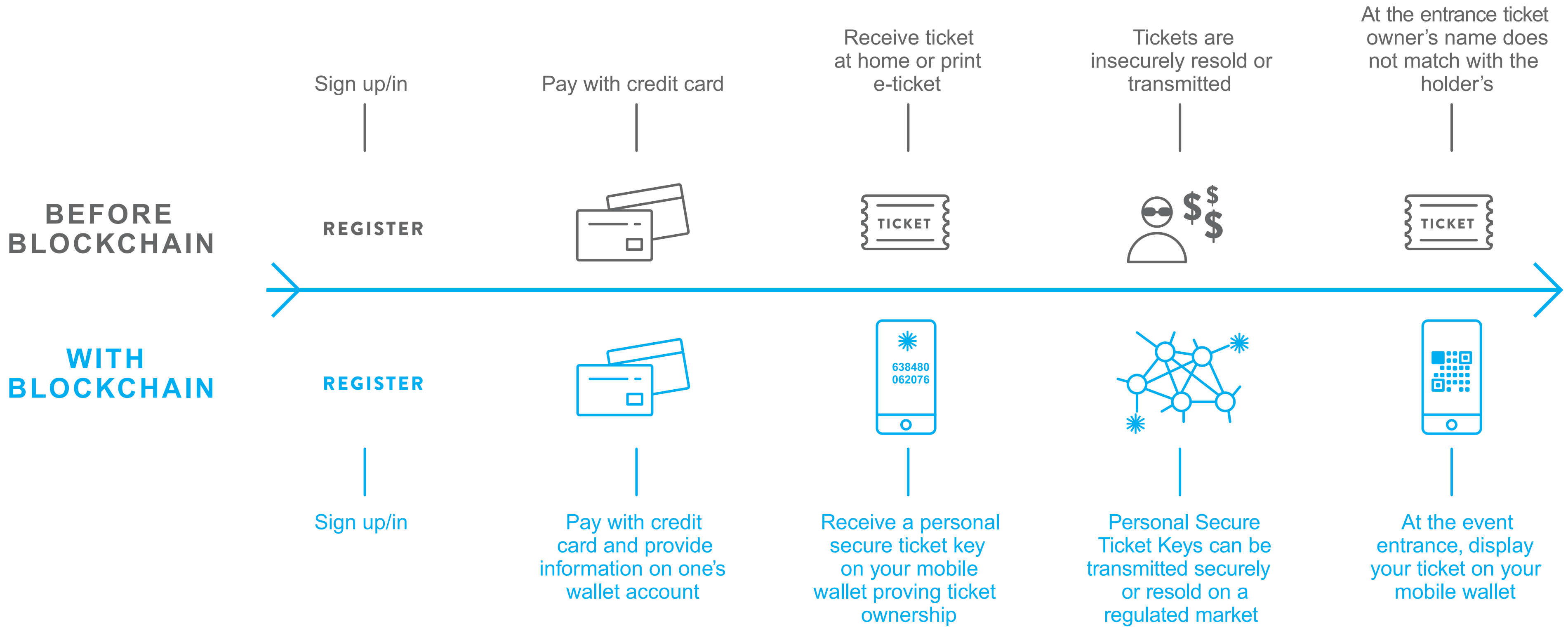
Blockchain is a distributed database that maintains a continuously-growing list of transactions grouped in so called blocks. Each block contains a timestamp and a link to a previous block secured with encryption. Also, each recorded transaction needs to comply with a digital 'smart contract' that defines the market regulation rules. So, in effect, blockchain is a decentralised digital ledger that validates and records transactions on thousands of computers globally. This means the transactions cannot be altered retrospectively, as there are so many copies.

Every digital industry has an interest in blockchain. It's the basis of cryptocurrencies such as bitcoin; the Chinese giant Alibaba intends to use it to combat food fraud; and the R3 consortium of banks want to use it as an auto regulated ledger. And now we can look to apply it to the ticketing industry.



2. HOW BLOCKCHAIN WORKS IN TICKETING

When using blockchain, the initial purchase is exactly the same as it is currently, with total freedom for the ticketing provider. Payment is also the same. The difference comes when the ticket is issued to the client.



BEFORE BLOCKCHAIN

Sign up/in

REGISTER

Pay with credit card

Receive ticket at home or print e-ticket

Tickets are insecurely resold or transmitted

At the entrance ticket owner's name does not match with the holder's

WITH BLOCKCHAIN

REGISTER

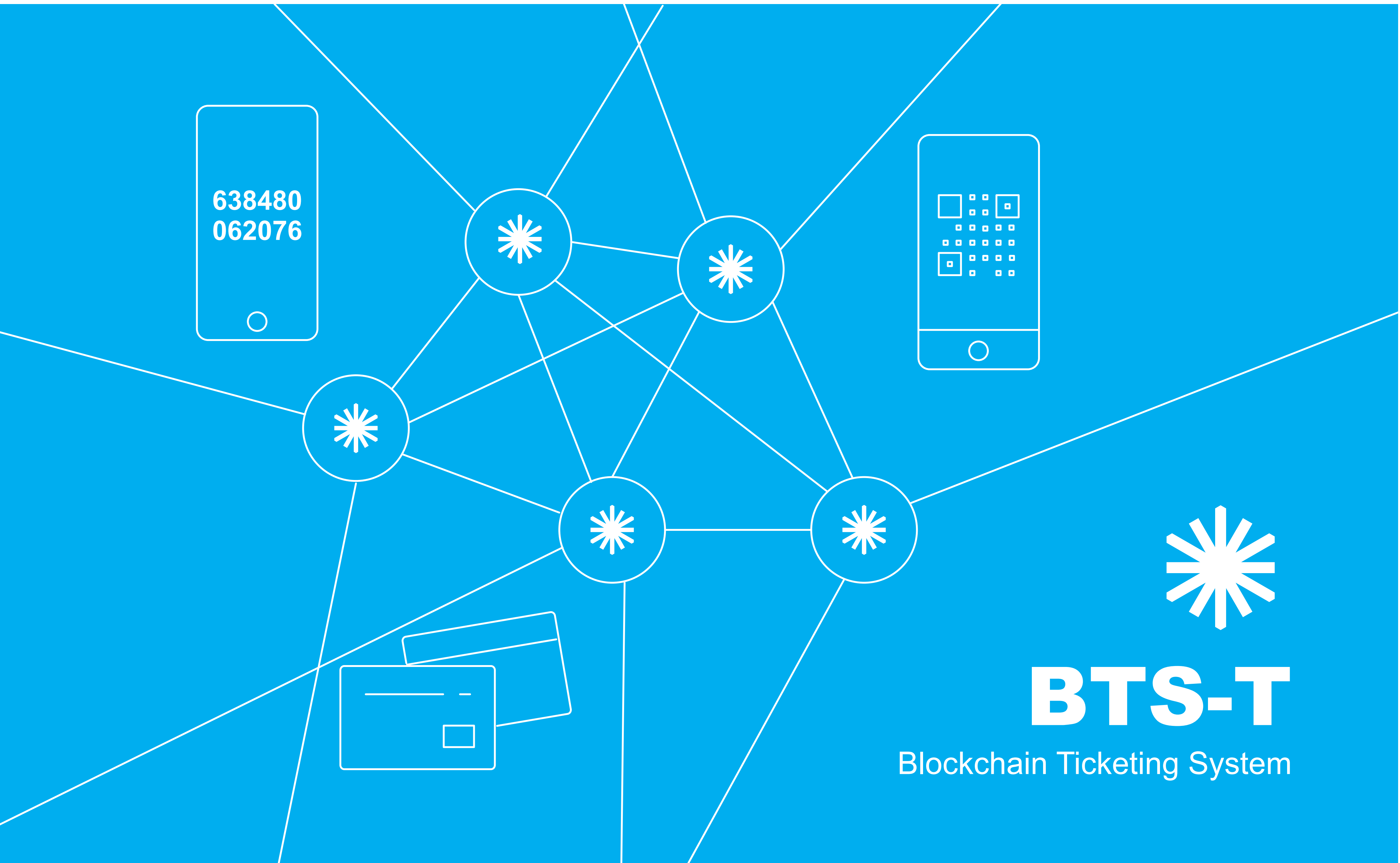
Sign up/in

Pay with credit card and provide information on one's wallet account

Receive a personal secure ticket key on your mobile wallet proving ticket ownership

Personal Secure Ticket Keys can be transmitted securely or resold on a regulated market

At the event entrance, display your ticket on your mobile wallet



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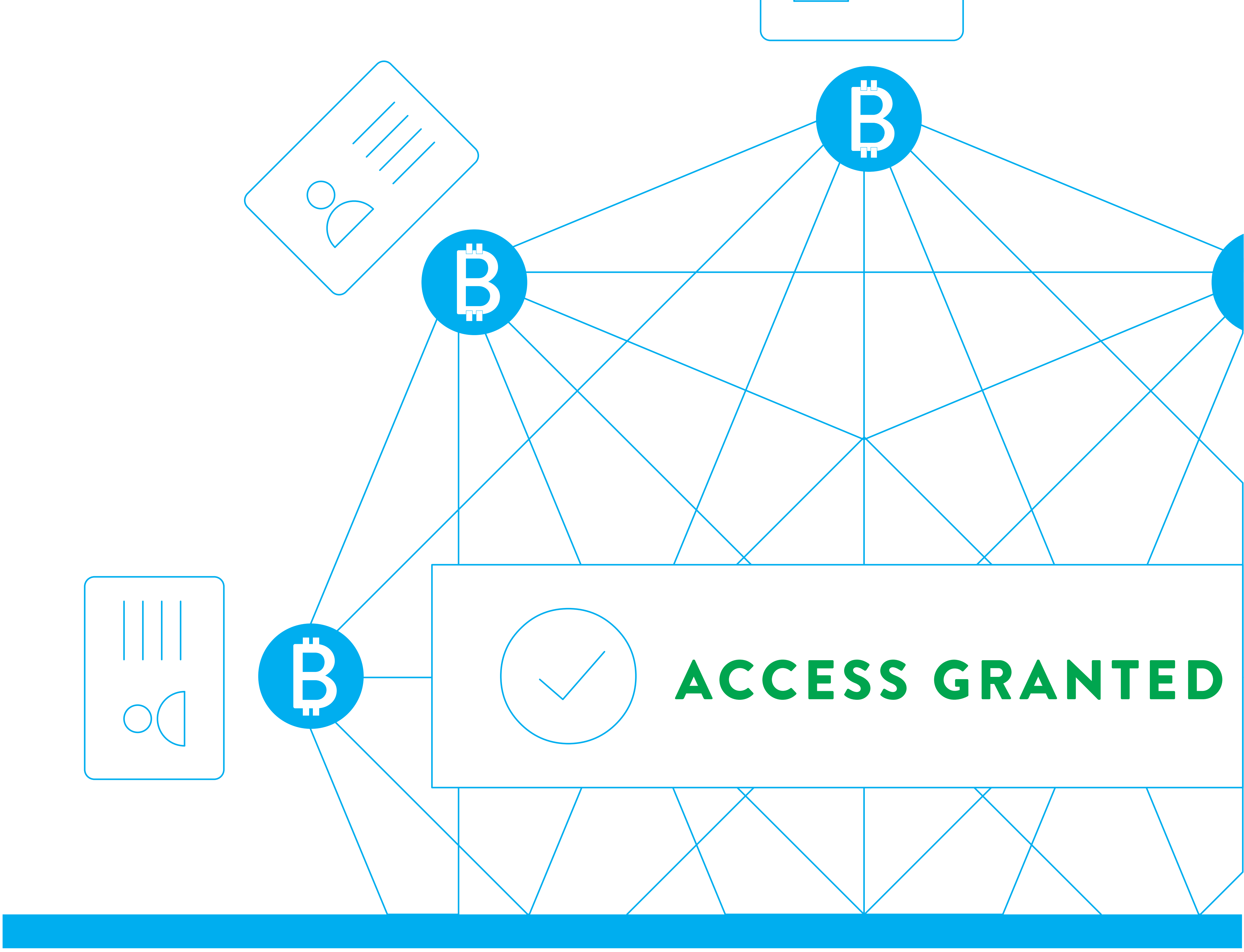


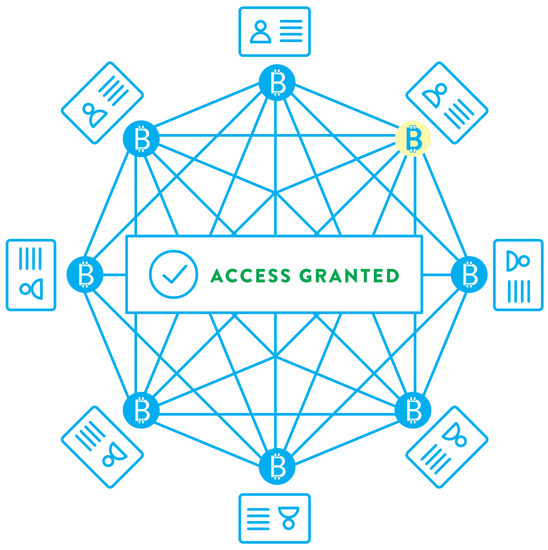
HOW BLOCKCHAIN WORKS IN TICKETING

ACCESS CONTROL

The lack of a barcode may cause venue operators concerns about access control. There are two ways to tackle this.

① Blockchain aware access control

The venue can invest in reliable and fast ‘blockchain aware’ access control. These will directly interact with the e-wallet via Bluetooth or NFC (Near Field Communication) and check the validity of the ticket inside the blockchain.

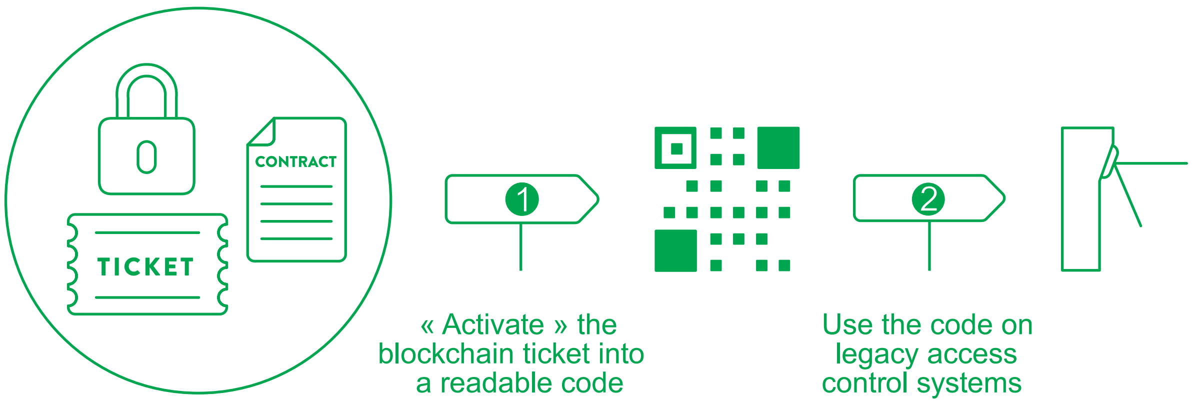


The access control software integrates with the blockchain in a uniform and standard way regardless of which system originated the ticket, and regardless of whether the ticket was transferred or resold. The venue can manage this type of access control using either smartphones or tablets.

② Two-step access control

If you already have barcode based access control software and several dozen existing turnstiles or mobile readers, it does not mean that you have to get rid of them.

There can be a «two-step access control» where the ticket is first extracted from the blockchain and materialized into a standard barcode, allowing use of the existing access control.This extra step can be smoothly added in the physical screening step, using very cheap devices. So you can enjoy all the advantages of blockchain tickets without incurring high setup costs.



« Activate » the blockchain ticket into a readable code

Use the code on legacy access control systems

4. SECURITY

THE PROBLEM

Given recent terrorist attacks, security is a top priority for operators of venues of any size, from 80,000 seater stadiums to smaller 2,000 standing venues. Customers expect that organisers will do bag checks on every person, but when tickets get resold and end up in the hands of a different person, this becomes a daunting task. Some venues are installing X-ray scanners or other types of physical screening, similar to airport security, which in turn takes away some of the enjoyment and ease of attending events.

Security is a top priority for operators of venues of any size.

HOW BLOCKCHAIN CAN HELP

Everything that happens in the blockchain is audited and impossible to modify afterwards. Therefore an event organiser will always know, at any time, which e-wallet owns a ticket. This means they can cancel the ticket or get in direct contact with the owner. It allows the application of KYC (Know Your Client) processes to identify and verify customers.

Everything that happens in the blockchain is audited and impossible to modify.

This technology can also be enhanced with secure or trusted e-wallets. In the UK, for example, YOTI lets you build a secure e-wallet bound to an individual's passport. If a ticket wallet is linked to this type of official wallet, and access control is augmented with some biometrics, you can then be one hundred percent sure of who is attending, helping to mitigate the security risks.

How blockchain can help

Enhanced Security

Transaction uniqueness and traceability

5. CUSTOMER TRUST

THE PROBLEM

A big concern for those buying tickets is whether they have paid for a real one or a fake. Customers are being defrauded by fake ticket websites posing as legitimate authorised ticketing agents. This leads to massive disappointment, loss of money and increasing levels of mistrust of the ticketing industry.

Customers are also concerned with being able to resell their ticket safely and securely at a fair price, or to hand it over to a friend if they can't attend. Will the new ticket owner be turned away at the entrance ?

HOW BLOCKCHAIN CAN HELP

Blockchain enhances customer trust levels because they can be guaranteed they are buying a valid ticket and it puts a stop to duplicate sales.

If they want to switch the ticket to a friend, they can simply click on "send to a friend", add their identity details, and the data is updated in the blockchain when the recipient receives the tickets.

How blockchain can help

Greater User Trust

Certificate authority for origin, validity and price

7. LACK OF AN INDUSTRY PROTOCOL

THE PROBLEM

Unlike many other industries, there is no standard protocol in ticketing. This means we can't exchange data or track customers beyond the boundaries of a given supplier.

The lack of an exchange protocol in the industry facilitates fraud on the secondary market. When a ticket is resold on the secondary market, it no longer belongs to the original buyer whose details the event organisers have. Therefore event organisers do not know exactly who is at their event. This is due to the fact that tickets are issued in a format that cannot be adapted for exchanges on the secondary market. Not only can you not change the name of the ticket holder, but you cannot control how many times it will change hands.

Finally, there are many access control solutions, but each of them has to interface with the chosen ticketing solution. If there were a standard ticketing protocol, all access control solutions would be compatible with all ticketing solutions issuing them. New installations would be quicker and cheaper.

Blockchain will create a standard ticketing protocol. The technology acts as a giant database, thereby creating a de facto standard.

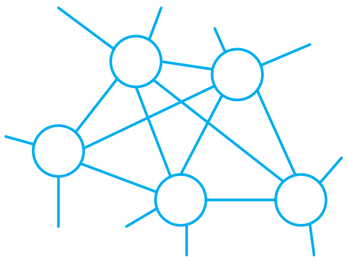
HOW BLOCKCHAIN CAN HELP

Blockchain will create a standard ticketing protocol. The technology acts as a giant database, thereby creating a de facto standard. Every ticketing company and access control provider will have a standardised implementation for existing and new business. All this is backed by intrinsic permissions and data access authorizations built into the blockchain. Therefore an organiser can easily grant any access control provider the authority to verify his tickets.

When a ticket holder passes their ticket onto a friend, the smart contract execution will cancel the original ticket and create a new one for the friend. It disappears off their e-wallet and appears in the new ticket holder's e-wallet. This avoids any confusion at the gate, as the new ticket works with the access control.

How blockchain can help

Open Exchange Standard



Easy access to tickets stored in blockchain

BLOCKCHAIN: SILVER BULLET OR NOT ?

Blockchain will definitely be a game changer. We are about to trial it with one of Europe's biggest festivals, Paleo, in July this year and will provide an update on our findings from this test. Whatever the outcome of this pilot, it's important that the industry recognises blockchain does not solve all the problems at a stroke:

① Card payment fraud

There is still a requirement for a money transfer to purchase the ticket and we are all too aware of the possible fraud with card payments. One solution is to bind the blockchain to a cryptocurrency. Technically, such binding is feasible: Ethereum is the best known. But the time when people pay exclusively with cryptocurrencies is some way off.

② Ticket transfer still possible

Nothing prevents a ticket holder from selling a ticket that's held within a blockchain, but at least with the technology we will know that the transaction has happened. The smart contract may restrict the price paid for resale but it cannot prevent money changing hands at the same time, such as a cash payment.

③ Fake data

There will still be some 'Donald Ducks' and 'Mickey Mouses' trying to attend events as we can't prevent people from inputting fake data. But of course they can be stopped at the gate.

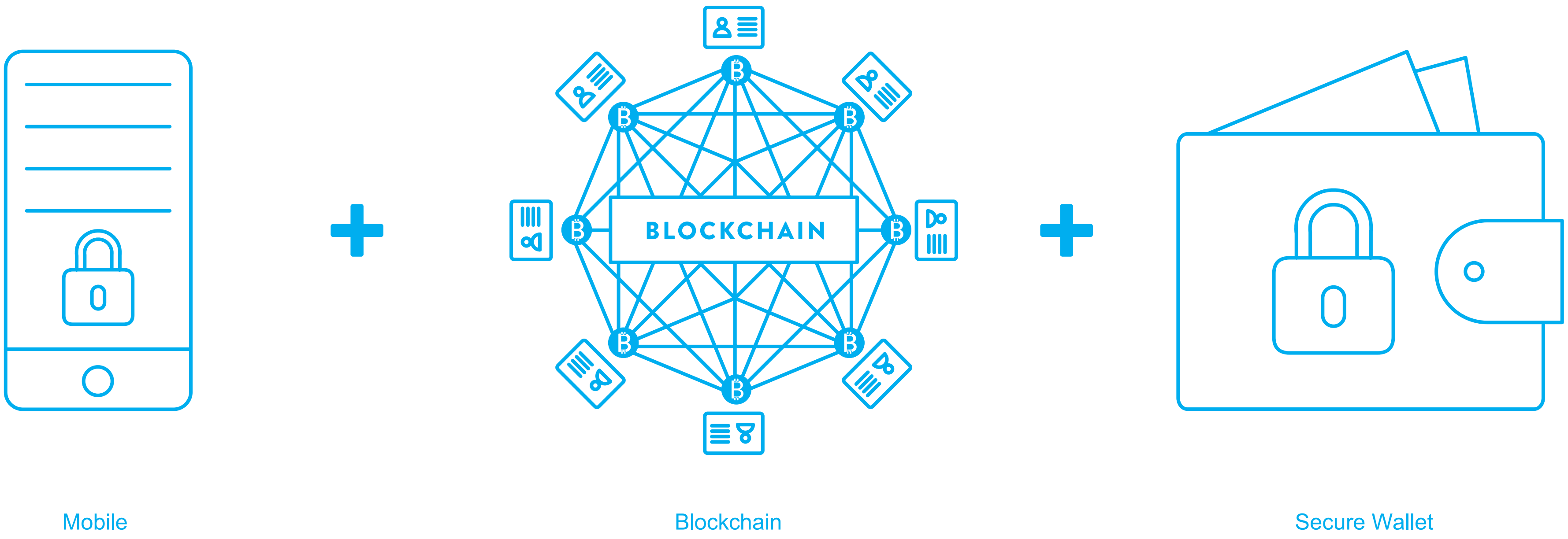
④ Trial & adoption of a new technology

Whilst we are confident blockchain will be part of the solution, this technology is still at its early stages of application. As with any new paradigm, surmounting a number of technology and user adoption challenges will be key to its success.

SecuTix has a proven history in being at the forefront of new technologies and we are convinced that blockchain should be part of a wider technology stack to provide a robust and global tool to combat the black market.

8. CONCLUSION

We are starting to leverage the blockchain, merging it with mobile and access control to create a technologically responsive e-ticket that you cannot copy or transmit without following certain guidelines and rules. It allows the organiser to know who will attend and to ensure that tickets are resold at a fair price. Blockchain creates a real opportunity for a dramatic change in the way the ticketing industry deals with fraud. It is a powerful tool to mitigate the risk of fraud. I won't pretend that blockchain is the ultimate response, as fraudulent professionals will always find a way to react to the technology advances, but it will make things much more complicated for them.



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Blockchain Ticketing System

Based on a DISCUSSION PAPER AUTHOR:Vincent Larchet